Serial No. 08/702,625
Art Unit: 1711

The advantage of the present invention is that the disposable container can be discarded without special procedures for handling as toxic waste. The container can be disposed of in normal channels since the container does not contain a substantial amount of diisocyanate monomers.

The system and the composition comprises a disposable, pressurized container containing the composition comprising at least one polyisocyanate or isocyanate prepolymer having NCO content of from about 8% to about 30% by weight based on the prepolymer, at least one catalyst for the reaction of the isocyanate group with an OH group, at least one blowing agent and at least one foam stabilizer. One day after application of the plastic foam from the disposable pressurized container, the residue left in the pressurized container has a diisocyanate monomer content of less than 5% by weight based on the residual content of the emptied container. Applicants respectfully submit that the invention is neither taught nor suggested by the prior art references cited by the Examiner.

As used in the claims, the terms polyisocyanate or isocyanate prepolymer are defined in the specification. The term polyisocyanate refers to a composition which is derived from a crude mixture of isocyanates from which at least a portion of the mono and diisocyanates have been removed. The poly isocyanates and their preparation in relation to polymer - MDI is described at page 8 from line 27 through page 9 line 18. The term isocyanate prepolymer refers to an oligomer containing reactive NCO groups formed by the reaction of diisocyanates with compounds containing active hydrogen. Compounds containing active hydrogen as set forth in the specification for forming the prepolymers include hydroxy functional materials and materials containing NCO reactive groups such as -COOH, -SH, $-NH_2$, and >NH groups (see page 10 line 29 through page 11 line 2). Isocyanurates can also be used.

The polyisocyanates and/or the polyisocyanate prepolymer are mixed with a catalyst for reaction with OH groups (moisture in the air), foaming agents, and a foam stabilizer. The mixture is introduced into the disposable container and the foam is generated by releasing a portion of the mixture from the pressurized container. The present invention differs from the prior art in that the material which remains in the container after release of the mixture has a sufficiently low content of diisocyanates that the disposal of the pressurized container can be accomplished by normal means of disposal and does not require disposal as a hazardous waste.

Claims 15-68 stand rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out a distinctly claimed subject matter, which applicant regards as the invention. The Examiner states that claims 15-16 fail to correspond in scope with what Applicants regard as the invention. The evidence can be found in paper 13 filed 3/30/98. In that paper, the Examiner states "Applicant has stated that their claims require the use of isocyanate prepolymers prepared from an isocyanate compound and an -OH group containing compound, and this statement indicates that the invention is different from what is defined in the claims because the claims do not require that the "prepolymer" component be anything more than an isocyanate, a polyisocyanate, a cyclotrimer of a diisocyanate, and polymer MDI." Applicants respectfully submit that the terms polyisocyanate and a polyisocyanate prepolymer as used in the claims are defined in the specification.

Applicants respectfully submit that Applicants have perused paper number 13 and can find no statement by Applicants that their invention requires use of isocyanate prepolymers prepared from an isocyanate compound and -OH group containing compound. If Applicants have made such a statement, the statement is clearly in error and contrary to the teachings of the specification and in particular page 10,

line 29 through page 11, line 2. Applicants submit that the specification clearly teaches that compounds containing -COOH, -SH, $-NH_2$, and >NH are useful along with the -OH group containing compounds to form the prepolymers. Applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection.

Claims 37-39 stand rejected under 35 USC 102(e) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Muller at al. (U.S. 5,270,348), Volkert et al (U.S. 5,278,195) and Trinks et al. (U.S. 5,349,040), each taken individually. Applicants have cancelled claims 37-39 from the application and the rejection is moot.

Claims 40, 52, and 59-64 stand rejected under 35 USC 102(e) as anticipated by Muller et al, Volkert et al and Trinks et al. Applicants respectfully submit that Muller et al, Volkert et al and Trinks et al, whether considered alone or in combination neither teach nor suggest the present invention. Applicants submit that the composition of the present invention is neither taught nor suggested by any of the references.

Muller et al is deficient in that the composition does not utilize or contain a blowing agent. A blowing agent is a critical component of the present invention.

Trinks et al is deficient in that the composition is an adhesive and not a foam. The composition does not contain a blowing agent and does not contain any material which might make it foam. Applicants therefore respectfully submit that Trinks et al is not pertinent to the present invention.

Volkert et al is not pertinent to the present invention since it neither teaches nor suggests the mixture of a polyisocyanate or polyisocyanate prepolymer, a blowing agent, catalyst for the reaction of the isocyanate groups with an OH

group and a foam stabilizer. As shown in Volkert et al, the composition is a two component composition and the blowing agent, catalyst and foam stabilizer are mixed with the polyol portions of the two component system. Applicants respectfully submit that Muller et al, Volkert et al or Trinks et al neither teach nor suggest the composition of the present invention nor use of the composition. Applicants respectfully request that the rejection be reconsidered and withdrawn.

Claims 15-68 stand rejected under 35 USC 103(a) as unpatentable over Plaschka et al (U.S. 4,508,244) in view of Muller et al, Volkert et al, CA-2,084,698 and Minato et al (U.S. 5,086,175). Applicants respectfully submit that Plaschka et al, Muller et al, Volkert et al, CA-2,084,698 and Minato et al, whether considered alone or in combination neither teach nor suggest the present invention.

As the Examiner states:

> "Plaschka et al. disclose a pressure can for dispensing polyurethane foam wherein a foam precursor material is stored under pressure with a propellant gas which behaves as both propellant and blowing agent"

Applicants submit that Plaschka et al is not pertinent to the present invention since it solves the container disposal problem in a substantially different way from Applicants. Plaschka discloses at column 2, lines 44, 45, that:

> "The invention also permits the use of the piston for complete emptying of the foam forming compound components."

And at column 5, lines 44-49, Plaschka et al teaches:

> "This piston finally reaches its end position, in which it abuts against the dome 8 or the closure flap 11. Propellant gas then penetrates between the

> piston skirt 15 and the cylindar wall 2 and pushes the liquid medium still enclosed in the greatly reduced or completely closed space 23 out through the valve 12, so that the can is completely emptied."

Applicants respectfully submit that since there is no residue of the mixture containing diisocyanates in the Plaschka et al container after it is emptied, there would be no need to take the special precaution of utilizing an isocyanate composition containing low amounts of diisocyanates or reacting any isocyanates which remain in the pressurized container after use. Applicants submit that there is neither teaching nor suggestion to provide a pressurized container with the composition as set forth in the present application.

Applicants respectfully submit that foamed polyurethanes can be formed from pressurized containers containing many formulations of the composition required to form the foam. However, as set forth in the specification at page 1, line 15 through page 2, line 22, which describes how the isocyanate prepolymers in the prior art mixtures in pressurized containers are formed, one skilled in the art reading Plaschka et al would not be led to the system of the present invention or the use of polyisocyanates or polyisocyanate prepolymers containing only small amounts of diisocyanate monomer. Applicants submit that there is no teaching or suggestion in any of the prior art references cited by the Examiner which would lead one skilled in the art to form the polyisocyanates or polyisocyanate prepolymers outside of the pressurized can and in addition provide materials containing only small amounts of diisocyanate monomer or in the alternative provide means for reacting the contents of the can with a material which would react with the diisocyanate monomer materials in the pressurized container after the container has been used.

CA-2,084,698 and Minato et al disclose methods for forming isocyanate prepolymers with reduced amounts of

diisocyanate monomers. These materials are indicated as useful for use in applications other than foams. In view of the prior art, there would be no suggestion to use these materials to form foams.

Applicants submit that one skilled in the art reading the teachings of Plaschka et al would not be led to the present invention since Plaschka et al substantially eliminates all of the materials from the pressurized container by virtue of its particular design and there is no need to reduce the amount of diisocyanate monomers in the residue in the disposable pressurized container. Applicants therefore respectfully submit that a rejection of claims 15-68 under 35 USC 103(a) as unpatentable over Plaschka et al in view of Muller, Volkert, CA-2,084,698, and Minato et al is untenable. Applicants respectfully request reconsideration and withdrawal of the rejection.

In view of the amendments entered in the application and the above discussion, Applicants respectfully submit that the application is in condition for allowance and favorable consideration is requested.

Respectfully submitted,

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